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15 SUBJECTS OF NOTE**15.10 EFFECTS TO TOURISM POTENTIAL AND WILDERNESS CHARACTER****15.10.1 Introduction**

The vast areas of wilderness of the NWT are an important feature for many residents, and the aesthetic qualities of this wilderness have an inherent value. Further, tourism in the NWT depends heavily on the wilderness character of the land. During the scoping sessions for the Taltson Hydroelectric Expansion Project (the Project), concerns were expressed regarding effects of the transmission line upon the aesthetic qualities of wilderness, and the proposed East Arm National Park (the Park). Limited road access, as well as availability of high-quality natural resources (e.g., wildlife and fish), is characteristic of wilderness tourism (FMB 2001). The purpose of this Subjects of Note (SON): Effects to Tourism Potential and Wilderness Character is to assess the potential effects of the Project on tourism and wilderness. The Terms of Reference (TOR) for the Project were issued on March 28, 2008 by the Mackenzie Valley Environmental Impact Review Board (MVEIRB 2008a). The Terms of Reference document is included in Chapter 1 - Introduction and the complete Table of Concordance for the Developer's Assessment Report (DAR) is in the Preamble.

National parks are an important part of the wilderness and tourism experience in that they protect natural environments and are gateways to nature, adventure, discovery, and solitude (Parks Canada 1997). The proposed Park is situated in the region of the East Arm of Great Slave Lake. The potential effects of the Project on the proposed Park would be discussed within the larger context of effects to the NWT's wilderness character. This chapter thus includes an assessment of the following:

- potential effects on the availability of the natural resources (i.e., fish and caribou), which form the basis of the tourism activities; and
- potential effects on the wilderness character of the tourism experience.

Sport hunting in the NWT is conducted by both residents and non-residents of the NWT. Non-residents of the NWT require the services of an outfitter and usually use hunt from the various remotely located hunting lodges in the NWT. Within the vicinity of the Project, the sport hunting industry concentrates around the barren-ground caribou, but muskoxen, wolverine and wolf are also available.

While the main tourism season runs from May 15 to September 15 (ITI 2007), the GNWT promotes a variety of activities throughout the year, such as hiking, fishing, boating, camping and wildlife viewing in the summer months, and snowmobiling, snowshoeing, and aurora borealis (northern lights) viewing in the winter months.

Ecotourism is one of the main attractions to visitors to the NWT, as well as residents, who wish to explore Canada's north. They are attracted by the unique and pristine flora, fauna, and cultural heritage that the NWT has to offer. Tourists are also seeking ways in which to learn more about surviving on the land with minimal supplies, and how to leave the smallest ecological footprint possible. Residents of the NWT have taken advantage of this market by offering guided tours and northern activities to tourists that are also considered eco-friendly, such as dog mushing, snowshoeing,

kayaking, canoeing, skiing, hiking, camping, wilderness viewing, aurora borealis viewing, cultural heritage camps, sustainable fishing and hunting. Hunting and fishing lodges also offer opportunities for non-consumptive tourism. For example, the Trophy Lodge offers spectacular views of the impressive cliffs of the Pethei Peninsula located along the East Arm of Great Slave Lake, and Plummers Arctic Lodge provides spectacular views of the Taltheilei Narrows on the East Arm.

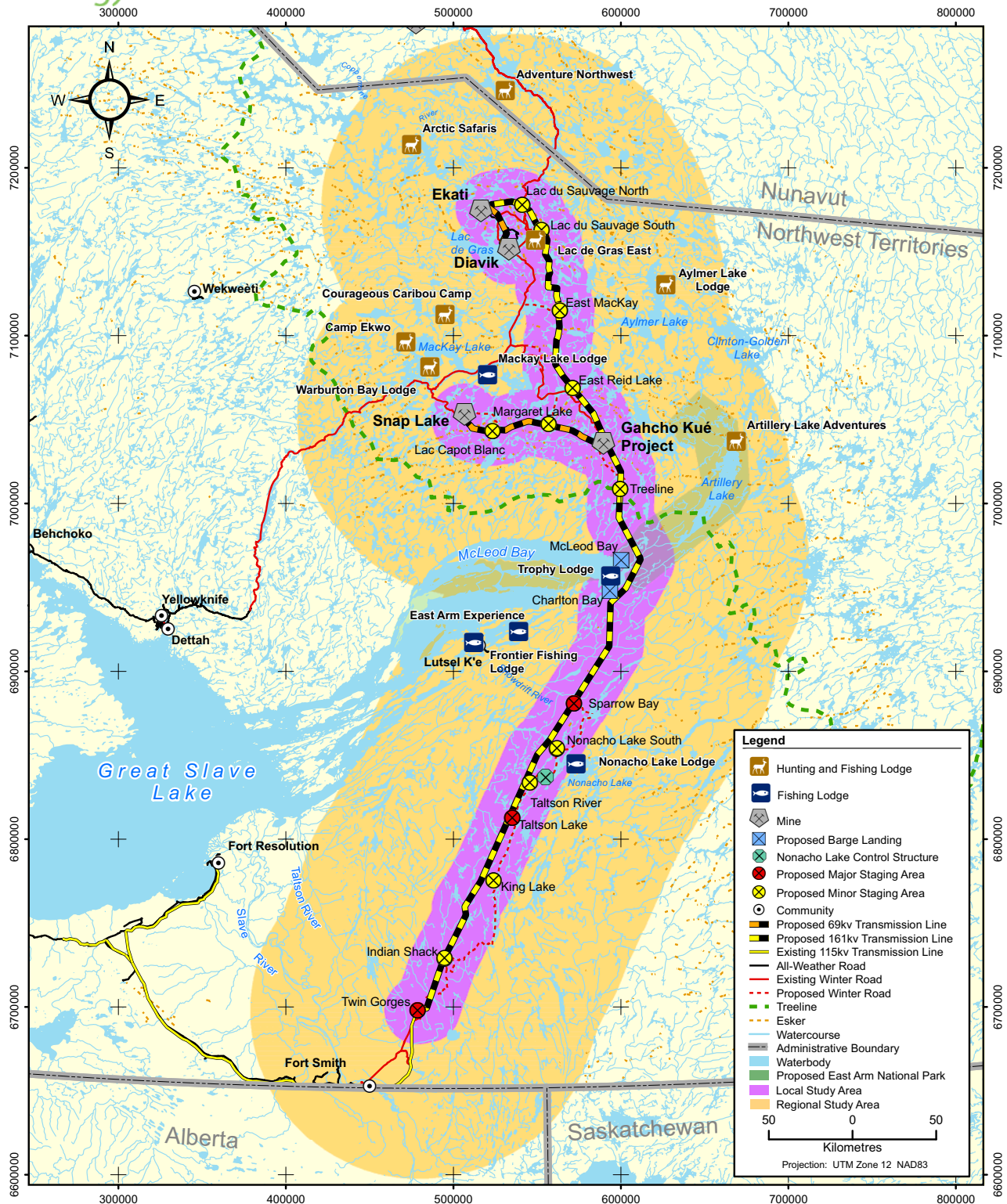
15.10.2 Approach

15.10.2.1 SPATIAL AND TEMPORAL SCALE OF ASSESSMENT

The spatial scales and boundaries selected for the effects assessment of the Project on tourism potential and wilderness character include two study areas, one local and one regional (Figure 15.10.1):

- **Local Study Area (LSA):** consists of the area within sight and hearing of the Project. This considered, in particular, the transmission towers and the helicopter activity which would take place along the length of the transmission line right-of-way (ROW), during both construction and operation.
- **Regional Study Area (RSA):** consists of the entire Project area (including both the transmission line and the winter roads), plus a 100 km buffer on either side. The boundary for the RSA was used to quantify baseline conditions at a scale that was large enough to assess the maximum predicted geographic extent of direct and indirect effects from the Project on valued components (VC). The study area includes the Ekati, Diavik and Snap Lake mines and the winter roads, which have the potential to increase access into otherwise remote wilderness areas. Also within the RSA are a number of tourist destinations, such as parks, protected areas, tourist lodges, and other tourist destinations that may be affected by the Project.

The expected length of time that Project-related stressors would influence VCs during the construction phase is three years. Currently, the Project is expected to be in operation for 20 years to service the existing and proposed diamond mines. However, the infrastructure would have a lifespan of at least 40 years, and it is the intent of Dézé to solicit new customers to extend the Project beyond 20 years. Subsequently, the expected length of time that Project-related stressors would influence VCs during the operation phase is assumed to be 40 years. Therefore, 40 years was defined as the longest reasonable duration of the operation phase for predicting and assessing effects from the Project.



TALTSON
Hydroelectric Expansion Project

Developer's Assessment Report
2009

Local and Regional Study Area for
Tourism Potential and Wilderness Character

Figure
15.10.1

15.10.3 Valued Components and Assessment Endpoints

An important aspect of the VC selection process is that it reflects the values expressed by concerned people during the public screening sessions. During the issue scoping exercises, concerns were expressed about the potential effects that the Project could have on tourism potential and wilderness character (MVEIRB 2008b). The selection process for VCs that address these concerns is described in the following sections.

15.10.3.1 APPROACH TO SELECTION OF VALUED COMPONENTS

Four VCs were identified for tourism potential and wilderness character. These VCs were selected by considering the predominant tourism activities in the RSA, the values and concerns expressed during public hearings, and elements identified in the TOR (MVEIRB 2008). The VCs used for assessing the effects to tourism potential and wilderness character were:

- sport fishing,
- sport caribou hunting,
- guided canoeing, and
- enjoyment of the wilderness.

These VCs were selected because they represent important non-traditional activities and contribute to the NWT economy. Tourism is a source of income and economic development, and depends heavily on the wilderness character of the land (for example, see GNWT 2008). Also, the Project may affect human enjoyment of the surrounding wilderness, including the proposed Park.

Caribou is a signature species for sport hunting and wildlife viewing in the NWT, and the Project footprint is located within the various seasonal ranges of the Bathurst Caribou Herd. As an example of the importance of caribou to the livelihood of the hunting lodges, Artillery Lake Lodge was issued 36 caribou tags in 2006, compared to 5 wolf tags and 1 muskox tag for the same year. Aylmer Lake Lodge was issued 60 caribou tags in 2006, compared to 9 muskox tags and 0 wolf tags for the same year. Additionally, the GNWT promotes caribou as one of the species for wildlife viewing. Thus, although other wildlife are harvested by sport hunters in the RSA, caribou sport hunting was viewed as the driver of this industry, and was selected as the VC.

15.10.3.2 ASSESSMENT ENDPOINTS

Assessment endpoints are general statements about the characteristic of the VC that is being protected. Assessment endpoints for the SON: Effects to Tourism Potential and Wilderness Character were preservation of:

- sport fishing opportunities,
- sport caribou hunting opportunities,
- guided canoe trip opportunities, and
- tourism potential and wilderness character.

15.10.4 Pathway Analysis

15.10.4.1 PATHWAY IDENTIFICATION

Pathways were developed to describe the ways that the Project may influence the VCs. These pathways were identified through reviewing concerns raised during the following:

- public information sessions in Fort Smith, Fort Resolution, and Hay River in March, 2004 (Rescan 2004);
- feedback received from the Aboriginal organizations, as well as territorial and federal government departments, during the land use permit application to the Mackenzie Valley Land and Water Board; and
- public hearings hosted by the MVEIRB, and the MVEIRB TOR (MVEIRB 2008a).

Pathway analysis identifies and screens the issues and linkages between Project components or activities and the potential effects on tourism potential and wilderness characteristics. A pathway analysis was completed for tourism potential and wilderness characteristics to identify Valid, Minor, and Invalid Project-related pathways.

15.10.4.2 MITIGATION

Mitigation practices and design features are incorporated into the Project design and planned operational practices to either remove the pathway through which the Project could affect tourism potential or wilderness character, or to reduce effects of pathways that cannot be eliminated. The VCs for tourism and wilderness character consist of two components: availability of the resource and resource accessibility. Because wilderness is characterized by a lack of road access into an area, operational practices or design features that reduce or eliminate road access into an area are considered beneficial to wilderness character.

Mitigation practices and design features include Project design, environmental best practices, and management policies and procedures. The potential pathways and the associated mitigation that would be incorporated into the Project to reduce or eliminate effects are listed in Table 15.10.1.

Table 15.10.1 — Mitigation Practices and Design Features to Reduce Effects to Tourism Potential and Wilderness Character

Project Component	Pathway	Pathway Duration	Valued Component	Mitigation
Winter access roads Temporary access trails Barge landing	Change in access affecting sport fishing and sport caribou hunting Change in access to proposed East Arm National Park	Construction Operations	Sport fishing Sport caribou hunting Enjoyment of the wilderness	Proposed winter roads for the Northern Sector would make use of existing winter roads and are expected to have negligible effect on access to wilderness area Winter roads constructed for the southern sector would be temporary winter roads, used for only three winter seasons. Public use of the southern sector winter roads would not be permitted Following construction (March 2011), the winter roads would no longer be constructed or maintained, and slash would be placed across the lower portages to discourage human use Recreational use of Project vehicles would not be permitted There would be no winter roads or temporary access trails within the proposed East Arm National Park
Nonacho Lake control structure Winter access roads Temporary access trails Transmission line Barge landing Substations	Change in availability of caribou for sport hunting	Construction Operations	Sport caribou hunting Enjoyment of the wilderness	Construction activities in the vicinity of the caribou hunting camps would take place in winter, outside of the caribou hunting season Adjustments would be made to tower locations during construction to avoid sensitive areas
Nonacho Lake control structure South Valley Spillway Twin Gorges facilities	Change in availability of fish for sport fishing	Construction Operations	Sport fishing Enjoyment of the wilderness	DFO Operational Statements for Ice Bridges and Snow Fills in the NWT would be followed (DFO 2007). DFO Operational Statements for water withdrawal in the NWT would be followed (DFO 2005). Roads would avoid steep slopes Cut trees may be placed on steep slopes to reduce erosion potential. Erosion and Sediment Control Environmental Management Plan would be developed and adhered to. Disturbance to riparian zones would be avoided where practical. Stream crossing locations would consider bank stability and

Project Component	Pathway	Pathway Duration	Valued Component	Mitigation
				<p>erosion potential.</p> <p>Recreational use of construction vehicles would not be permitted.</p> <p>Environmental sensitivity training for all staff would include a unit on erosion and sediment control.</p> <p>Existing permitted lake levels would be maintained.</p>
<p>Nonacho Lake control structure</p> <p>South Valley Spillway</p> <p>Twin Gorges Facilities</p> <p>Transmission Line</p> <p>Barge Landing</p>	<p>Effect to aesthetic quality of rivers used by canoe outfitters</p>	<p>Construction</p> <p>Operation</p>	<p>Guided canoeing</p>	<p>The Project would not affect navigability of rivers.</p> <p>The transmission line would not cross rivers commonly used by canoe trip outfitters.</p>
<p>Winter Access Roads</p> <p>Transmission Line</p> <p>Barge Landing</p>	<p>Effects of noise to tourist enjoyment of wilderness</p> <p>Effects of visual aesthetics to tourist enjoyment of wilderness</p>	<p>Construction</p> <p>Operations</p>	<p>Enjoyment of the wilderness</p>	<p>Construction activities in the vicinity of the caribou hunting camps would take place in winter, outside of the caribou hunting season.</p> <p>There would be a minimum flying altitude of 300 m for cargo and passenger aircraft when outside of the Project area.</p> <p>Transmission line noise would be negligible during operation.</p> <p>Staging areas on Great Slave Lake would be at least 300 m inland, reducing the effects of noise to Great Slave Lake.</p> <p>Transmission line crossing of the Lockhart River within the proposed East Arm National Park would be determined through discussion with the community of Łutsel K'e.</p> <p>Adjustments were made to the transmission line alignment between the Gahcho Kué Project and Ekati Diamond Mine to make it less visible from tourist destinations on MacKay Lake and Lac de Gras.</p>

In addition to the mitigation that reduces the potential effects of the Project on tourism potential or wilderness character, other Key Lines of Inquiry or Subjects of Note discuss the mitigation and residual effects to the various resources themselves. For example, a detailed presentation of design features to reduce the potential effects of the Project to caribou, fish, navigability and access can be found in the Key Lines of Inquiry Barren-ground Caribou (Section 12) and Water Fluctuations in the Taltson River Watershed (Section 13), and the Subject of Note - Access (Section 15.5).

15.10.4.3 PATHWAY VALIDATION

In the pathway validation step, each potential pathway was screened to assess its validity for the Project after mitigation practices and design features have been incorporated. Each potential pathway is evaluated and characterized as follows:

- **Invalid** – pathway does not exist, is removed by mitigation, or mitigation results in no detectable (measurable) change and residual effect relative to baseline or guideline values.
- **Minor** – mitigation results in a minor change from the pathway, but has a negligible residual effect (e.g., a small reduction in amount of aesthetic quality, or a short-duration stressor such as helicopter overflights, but have little effect on the tourism industry or the integrity of the wilderness).
- **Valid** – a pathway that likely contributes to residual effects to a VC.

Invalid, Minor or Valid pathways are determined using scientific knowledge, logic, and experience with similar developments. Invalid and Minor pathways were not carried forward into the effects assessment. A more detailed analysis of potential effects is conducted for Valid pathways. A summary of the pathways investigated, and their validity, is provided in Table 15.10.2. Full details are provided in the sections below.

Table 15.10.2 — Pathway Validation Results for Tourism Potential and Wilderness Character

Project Component	Pathway	Pathway Duration	VC	Pathway Validity
Winter Access Roads Temporary Access Trails Barge Landing	Change in access affecting sport fishing and sport caribou hunting	Construction Operations	Sport fishing Sport caribou hunting Enjoyment of the wilderness	Invalid
Winter Access Roads Temporary Access Trails Barge Landing	Change in access to proposed East Arm National Park	Construction Operations	Enjoyment of the wilderness	Invalid
Nonacho Lake control structure Winter Access Roads Temporary Access Trails Transmission Line Barge Landing Substations	Change in availability of caribou for sport hunting	Construction Operations	Sport caribou hunting	Minor
Nonacho Lake control structure South Valley Spillway Twin Gorges facilities	Change in availability of fish for sport fishing	Construction Operations	Sport fishing	Minor
Nonacho Lake control structure South Valley Spillway Twin Gorges Facilities Transmission Line Barge Landing	Effect to aesthetic quality of rivers used by canoe outfitters	Construction Operations	Guided canoeing	Minor
Winter Access Roads Transmission Line Barge Landing	Effects of noise to tourist enjoyment of wilderness	Construction Operations	Enjoyment of the wilderness	Minor
Winter Access Roads Transmission Line Barge Landing	Effects of visual aesthetics to tourist enjoyment of wilderness	Construction Operations	Enjoyment of the wilderness	Valid

15.10.4.4 INVALID PATHWAYS

Pathways may be Invalid if the activity does not occur, or if the pathway does not affect an assessment endpoint relating to tourism potential or wilderness character. Invalid pathways are not assessed in the effects analysis for tourism potential or wilderness character. The following section explains pathways that were determined to be Invalid for linking Project-related activities to effects on the tourism potential or wilderness character. These Invalid pathways are not carried forward to the effects assessment.

15.10.4.4.1.1 *Change in Access Affecting Sport Fishing and Sport Caribou Hunting*

During the construction phase of the Project, winter roads would be used to transport equipment and construction workers within the RSA. The proposed winter roads for the northern sector of the Project would use existing winter roads, such as the Tibbitt to Contwoyto winter road and temporary access trails from existing or proposed diamond mine sites. These roads often do not require clearing of vegetation, and would not be operable during the sport hunting season for caribou, which may only occur between 15 August and 30 November (ENR 2007). Within the southern sector, the Twin Gorges to Nonacho Lake winter road and temporary access trails would only exist during the winter, when the sport fishing lodges are closed. Thus, this pathway was determined to be Invalid.

15.10.4.4.1.2 *Change in Access to the Proposed East Arm National Park*

No winter roads are proposed within the boundaries of the proposed East Arm National Park. During the construction phase of the Project, winter roads and temporary access trails would be used to transport equipment and construction workers. The proposed winter roads for the northern sector of the Project would use the existing winter roads, such as the Tibbitt to Contwoyto winter road and spur roads from existing or proposed diamond mine sites. The northern sector winter roads would terminate at the treeline staging area, and would not enter the proposed national Park. The winter road for the southern sector would end at the Sparrow Bay staging area. Temporary access trails would extend from the Sparrow Bay staging area to the boundary of the proposed East Arm National Park, but would not extend into the Park. The southern sector winter roads would be closed to public use, and the entrance to the Twin Gorges to Nonacho Lake winter road would be blocked at the end of each hauling season through the use of gates, snow berms, and slash. After the construction phase (March 2011), the winter roads would no longer be constructed or maintained, and slash would be placed across the lower portages to discourage use. Thus, the Project is not anticipated to change access to the proposed Park, and the pathway was determined to be Invalid.

15.10.4.4.2 Minor Pathways

In some cases, both a source and a pathway exist, but the change caused by the Project is expected to be minor. Minor pathways are not assessed in the effects analysis for tourism potential and wilderness character. The following were determined to be Minor pathways for effects on tourism potential and wilderness character.

15.10.4.4.2.1 Change in Availability of Caribou for Sport Hunting

The availability of caribou is a function of changes in caribou abundance and caribou distribution. With regard to caribou abundance, population viability modelling has indicated that the Project would not cause any detectable changes to the population of the Bathurst caribou herd (the herd most affected by the Project). A full discussion of the Project's potential effects and cumulative effects on caribou herds can be found in the Key Line of Inquiry: Barren-ground Caribou (Chapter 12).

With regards to caribou distribution, the combination of direct (i.e., physical footprint) and indirect (i.e., noise and other sensory disturbances) effects can create a zone of influence (ZOI), which is an area within which caribou behaviour and occurrence may be affected. During construction, noise would be generated from mobile and stationary equipment, haul trucks on winter roads, helicopters, and aircraft within the RSA. Based on information regarding caribou behavioural reactions to development, it is anticipated that caribou presence within 5 km of the Project footprint may be affected (see Section 12 – Barren-ground Caribou). As none of the caribou hunting lodges are within 5 km of the Project footprint, caribou hunting and viewing opportunities are not anticipated to be noticeably affected by the Project.

Caribou hunting activity is unpredictable and dispersed throughout the above-treeline regions of the RSA. Smaller outpost camps or temporary drop camps, serviced through the main lodge, are often used by outfitters to access caribou (GNWT 2008). It is normal practice for sport hunters to travel long distances by boat to hunt caribou. For example, MacKay Lake is approximately 100 km long, and hunters may travel by boat to either end of this lake in search of caribou (G. Jaeb, True North Safaris, personal communication, 27 August 2008). The Lac de Gras Hunting Camp is within 9 km of the Ekati diamond mine (Misery Pit) and within 15 km of the Diavik diamond mine, but hunting activity has persisted at this camp. Considering the large areas over which sport caribou hunting currently occurs, the mobility of hunters using boats on large lakes, and the relatively small zone of influence of the Project, effects of the Project on caribou availability may be considered to be Minor.

15.10.4.4.2.2 Change in Availability of Fish for Sport Fishing

Construction and operation of the Nonacho Lake control structure and the South Valley Spillway may cause changes in water quality due to in-stream works, or changes in the hydrological regime of Nonacho Lake and downstream, with resulting changes in the quality of fish habitat. However, the variations are expected to be within the same range as found in baseline conditions (see Section 13 - Water Fluctuations in the Taltson River Watershed for further details on effects to fish). Effects to water quantity and quality would be confined to the Taltson River downstream of Nonacho Lake. As such, any effects to fish would be confined to the Taltson watershed. Effects to the availability of fish for sport fishing are considered Minor for the Taltson watershed, and Invalid for other watersheds through which the Project transmission line and winter roads would travel.

15.10.4.4.2.3 Effect to Aesthetic Quality of Rivers Used by Canoe Outfitters

The guided canoe trip industry depends upon both the qualities of the river and the wilderness through which the river travels. Major rivers within the RSA that are intercepted by the Project include the Taltson River, the Snowdrift River, the Lockhart River, and the upper Coppermine River. Of these, only the Coppermine River is used as a regular destination for canoe outfitters (see Blackfeather 2008 and Wanapitei 2008). However, the Project would cross the upper Coppermine, upstream of Lac de Gras, a reach not used by canoe outfitters. Of the top 12 rivers recommended by the NWT tourism website (GNWT 2008), neither the Taltson, Snowdrift, nor Lockhart rivers receive mention. Bathurst Arctic Services lists the Taltson and Snowdrift Rivers among the boreal forest rivers for which they offer guided canoe trips on demand (Bathurst Arctic Services 2008). Of these, the Snowdrift River would be crossed once by the transmission line. On the Taltson River, there would be aesthetic effects in areas due to the transmission line and upgrades to existing facilities (including the Nonacho Lake control structure, the South Valley Spillway, and the Twin Gorges facilities).

Further, much of the construction activity would take place during winter, outside of the canoeing season. Thus, while there are anticipated to be minor aesthetic effects to several rivers, no effects to the main guided canoe trip destinations would occur, and the overall effects to the guided canoe trip industry are anticipated to be Minor. There would be a slight change to the hydrology regime, which is not anticipated to affect navigability (discussed in Access - Section 15.5).

15.10.4.4.2.4 Effects of Noise to Tourist Enjoyment of Wilderness

The potential effects of Project noise on tourist enjoyment considered the sources and distribution of noise, and the potential overlap of noise with tourist destinations within the LSA. Noise would predominantly be created during the construction phase (from 2010 to 2012), although the seasonal and geographic locations of this noise would vary throughout construction (see Section 6.5 - Project Construction). During the construction phase, noise would be generated from mobile and stationary equipment, blasting, helicopters, and aircraft. Table 15.10.3 provides an estimate of the noise levels for various activities associated with the Project construction phase. These activities include clearing vegetation and construction activity, noise from a helicopter hovering at 200 m elevation, noise from a helicopter flying by at 200 m elevation, and noise associated with construction work at the staging areas.

During the construction phase, extensive use of low-level helicopter flights would be required within the transmission line ROW to place transmission line towers and string the conductor. Helicopters are anticipated to be the largest single source of noise, and the distance for helicopter noise to reach background levels is 6 km. During operations, aircraft would be used for the movement of personnel to the Twin Gorges site throughout the year. The distance for noise to reach background levels from the airstrip is 6 km (i.e., contained within the LSA); however, this noise would be limited to a few minutes during takeoff and landing, and a maximum of two round-trip flights per week.

The barge staging areas at Charlton Bay and McLeod Bay (the latter is within the proposed Park (see Figure 15.10.1)), would be active between May and September 2010, during March 2011, and between June and October 2011. During this time, construction and seasonal camp activity can be expected. As transmission line access and construction through the proposed East Arm National Park would be by helicopter (to reduce effects to vegetation), there may be a greater degree of noise than may be expected from winter road access and construction. This has been mitigated by placing the staging camps approximately 300 m to 400 m inland from Great Slave Lake, which would reduce noise and remove them from the viewshed of Great Slave Lake. Regardless, it is anticipated that noise from the staging areas and helicopter operations would be detectable from Great Slave Lake. Helicopter noise in particular may be above baseline levels for up to 6 km. Some seasonal effects to boaters on Great Slave Lake are therefore possible between June and September 2010, during March 2011, and between June and October 2011.

Table 15.10.3 — Construction Scenario Noise Predictions Relative to Distance from Activity

Distance from Source to Nearest Receiver (m)	PREDICTED NOISE LEVEL L_d (DBA) ¹			
	Clearing and Preparation (Staging or ROW)	Helicopter Work (hovering at 200 m)	Helicopter Work (fly-by at 200 m)	Staging Areas
1,000	41	46	41	42
2,000	34	39	34	35
3,000	30	33	29	30
8,000	12	16	11	12

¹ L_d (dBA) = daytime period noise equivalent noise level in A-weighted decibels.

Noise would not only emanate from the various camps and staging areas within the LSA, but from the transmission line construction activity, which would be dispersed over the entire length of the transmission line (also within the LSA). A list of 13 popular tourist destinations (including lodges, camp sites, boating sites and areas of cultural significance) is provided in Table 15.10.4. Tourists may include both out-of-territory visitors and local residents (aboriginal and non-aboriginal). The tourist destinations in Table 15.10.4 were selected to include locations used by both groups. For example, out-of-territory tourists are the most common clients at the sport hunting and fishing lodges and NWT residents are likely the most common group among boaters (including power boat, sailboat, and kayak) on Great Slave Lake during summer. Parry Falls is considered to be a culturally important area for the residents of Łutsel K'e (see Section 9.6 - Human Environment).

Two popular canoeing locations, Pike's Portage at Great Slave Lake and the Lockhart River outflow, are located less than 3.5 km from the transmission ROW (Table 15.10.4) and within the LSA. Both are within the proposed Park boundaries. Again, construction activity in that sector is anticipated to occur between May and September 2010, during March 2011, and between June and October 2011. Any canoeists that are at these locations while construction is occurring on the nearby ROW may be able to hear construction noise. Two other tourist locations, Trophy

Lodge and the Lockhart River outflow from Mackay Lake, are situated more than 3.5 km but less than 6 km from the Project ROW. If there are helicopters working at the Project ROW close to these locations, visitors to the camps or canoeists on the Lockhart River outflow may be able to hear them. The Nonacho Lake Lodge operates from mid-June to early September (Nonacho Lake Fishing Camp 2008), and offers sport fishing and sightseeing. As the camp is over 20 km from the transmission line route, no effects from noise are anticipated. Construction activity during the fishing season in the Southern sector would only take place in 2011 (see Section 6.5 - Project Construction).

Sport hunting for caribou within the RSA (hunting zone R/BC/01) may only occur between 15 August and 30 November (ENR 2007). Construction activity within the northern sector would occur only during winter (i.e., between January and April 2010, and January and March 2011; see Section 6.5 - Construction Methods). As such, there is no temporal overlap between caribou hunting and noise from Project construction.

During the operations phase, the generation of noise would be substantially less than during construction. Possible sources include corona noise from the transmission line, noise during transmission line inspections, and noise created from the Twin Gorges facilities and camp. Corona noise from the transmission line would be negligible (Teshmont 2008), although some noise may occur from the transmission line and towers as a result of wind. Other sources of noise during the operations phase would be the Twin Gorge facilities and transmission line inspections. The Twin Gorges facilities (and associated weekly aircraft flights) are not anticipated to affect any existing tourism lodges, as Twin Gorges is over 100 km from the nearest existing lodge (see Figure 15.10.1). Routine inspections of the transmission line are anticipated to occur once or twice per year, and would require a single helicopter flight along the entire length of the transmission line.

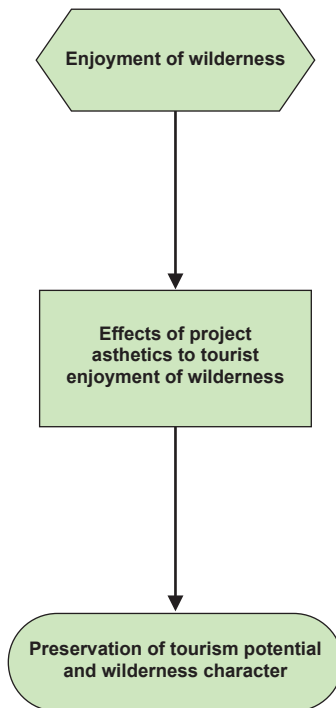
Overall, there may be some minor and short-term effects to tourist enjoyment of wilderness due to noise within the LSA. However, the noise would attenuate to background levels within 6 km, and in many cases the main sources of noise would not be active during the peak tourist season (i.e., the sport hunting and fishing season, or the canoeing season). Thus, effects from Project noise within the LSA were thus considered to be of negligible effect to tourist enjoyment of wilderness, and the pathway is considered to be Minor.

Table 15.10.4 — Distances to the Closest Tourist Destinations from the Project Right-of-Way

Destination	Activity	Location Relative to Treeline	Distance from Project Right-of-Way (km)
Pike's Portage: Great Slave Lake	Canoeing	Boreal	1.9
Lockhart River outflow	Boating/ cultural significance	Boreal	3.1
Trophy Lodge	Sport fishing	Boreal	4.6
Mackay Lake outflow	Sport hunting and fishing	Tundra	5.7
Lac de Gras hunting camp	Sport hunting and fishing	Tundra	6.3
Lac de Gras narrows	Sport hunting and fishing	Tundra	6.5
Charlton Bay	Boating	Boreal	6.5
North of Reliance	Boating	Boreal	9.3
Parry Falls (Old Lady of the Falls)	Hiking/cultural significance	Boreal	9.6
Nonacho Lake	Sport fishing	Boreal	15.3
Pike's Portage: Artillery Lake	Canoeing	Tundra	15.7
Nonacho Lake Lodge	Sport hunting and fishing	Boreal	20.8
Mackay Lake Lodge	Sort hunting and fishing	Tundra	33.1

15.10.4.4.3 Valid Pathways

All Valid pathways are carried forward and assessed in the effects analysis. One pathway is Valid for linking Project-related components and activities to effects on tourism potential and wilderness character. This is the effect of visual aesthetics on tourist enjoyment of wilderness, analyzed in the section below (see Figure 15.10.2).



15.10.5 Effects of Visual Aesthetics to Tourist Enjoyment of Wilderness

15.10.5.1 PROJECT-SPECIFIC EFFECTS

The assessment of effects of the Project to visual aesthetics employed a viewshed analysis in which the visibility of transmission towers and power lines was determined for tourist destinations within the LSA. The GIS analysis determined the potential number of transmission towers (based on 350 m spacing) visible from various receptor sites as well as the length of transmission line visible from the sites. The study area for the viewshed analysis was an LSA of 20 km on either side of the Project, which was chosen to include areas within the viewshed of the Project.

The viewshed analysis was performed based on the transmission line alignment and the Canadian Digital Elevation Data (CDED). Observation points were placed in regular intervals of 350 m along the transmission line to represent the proposed towers. For each of these observation points, the viewshed within 20 km was determined. The viewshed includes all the areas where an observer might see the Project. A tower height of 25 m and an observer height of 2 m was assumed. The final output of the analysis indicates all the areas where the transmission line would be visible. The analysis did not consider forest, which would obstruct some views. Locations south of the treeline are more likely to have some views obstructed. The CDED in the study area has a pixel size of approximately 17.75 m. There is no specific information about the vertical and horizontal accuracy of the data, derived from 1:50,000 National Topographic System maps.

Receptors for the viewshed analysis were the tourist destinations located within the LSA. Tourists may include both out-of-territory visitors and local residents (aboriginal and non-aboriginal). The tourist destinations in Table 15.10.5 and Figure 15.10.3 were selected to include locations used by both groups. For example, out-of-territory tourists are the most common clients at the sport hunting and fishing lodges, NWT residents are likely the most common group among boaters (including power boat, sailboat, and kayak) on Great Slave Lake during summer, and for the residents of Łutsel K'e, Parry Falls is considered to be a culturally important area (see Section 9.6 - Human Environment). Table 15.10.5 summarizes the tourist destinations in the viewshed analysis study area and describes whether the destinations are north or south of the treeline, the number of towers, and the length of transmission line that could be visible from the various tourist destinations.

Table 15.10.5 — Results of Viewshed Analysis of Tourist Destinations

Tourist Destination	Activity	Location Relative to Treeline	Length of Visible Transmission Line (km)	Number of Towers Visible from Destination	Distance to Transmission Line (km) from Tourist Destination
Lac de Gras Narrows	Sport hunting and fishing	Tundra	13	38	6.5
Lac de Gras hunting camp	Sport hunting and fishing	Tundra	1	3	6.3
MacKay Lake outflow	Sport hunting and fishing	Tundra	0	0	5.7
North of Reliance (on Great Slave Lake)	Boating	Boreal	15	43	9.3
Trophy Lodge	Sport fishing	Boreal	10	28	4.6
Lockhart River outflow	Boating/cultural importance	Boreal	2	7	3.1
Charlton Bay (on Great Slave Lake)	Boating	Boreal	0	0	6.5
Pike's Portage: Great Slave Lake	Canoeing	Tundra	0	0	1.9
Parry Falls (Old Lady of the Falls)	Hiking/cultural importance	Boreal	0	0	9.6
Pike's Portage: Artillery Lake	Canoeing	Tundra	0	0	15.7
Nonacho Lake	Sport fishing	Boreal	0	0	15.3

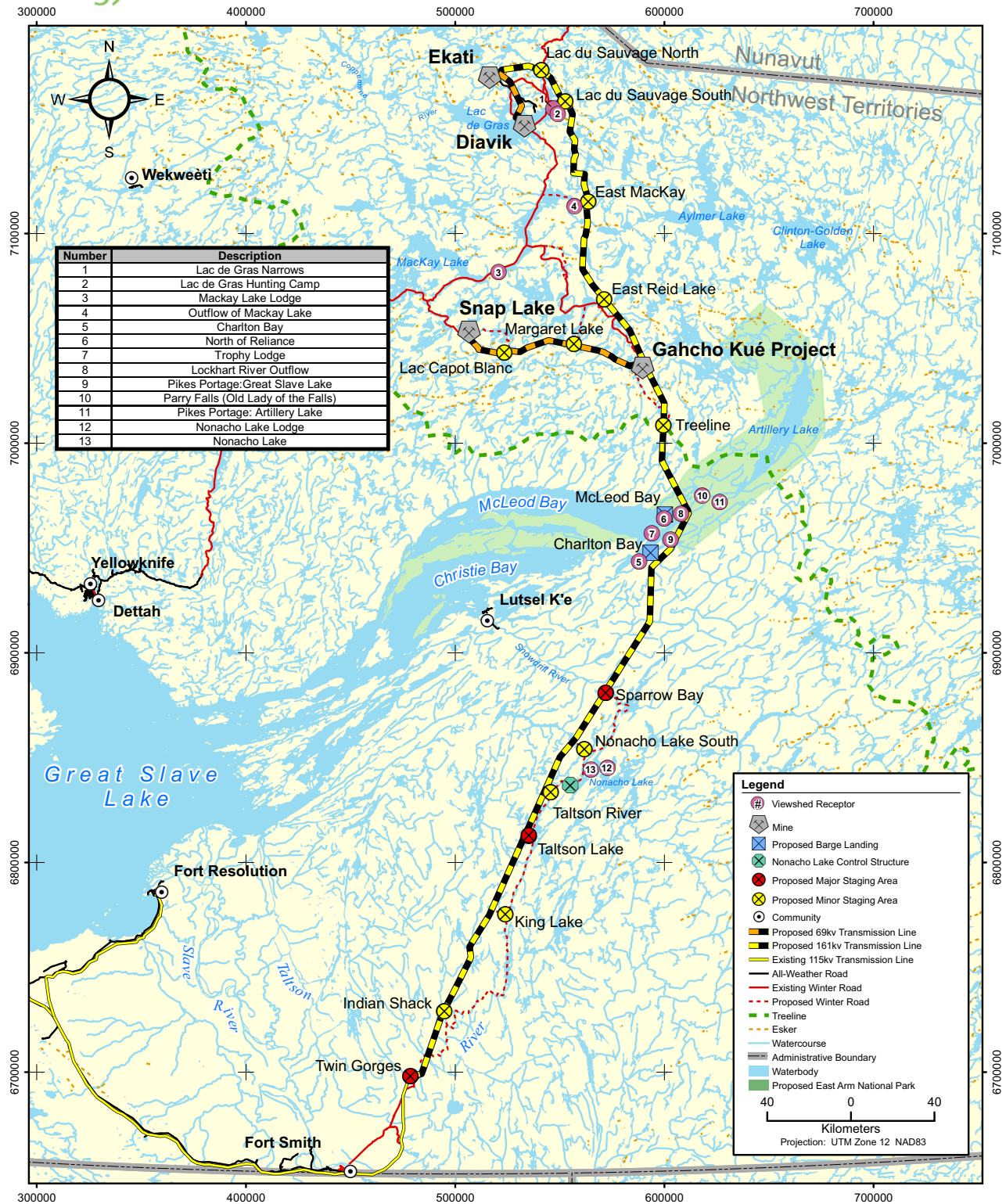


Table 15.10.5 shows that in the tundra regions, 38 transmission towers and 13 km of transmission line would be visible within the viewshed of the narrows between Lac du Sauvage and Lac de Gras. At the Lac de Gras Hunting Camp, 1 km of transmission line would be visible, at a distance of 6.3 km. Six of the destinations are within the proposed Park boundaries (North of Reliance, Trophy Lodge, the Lockhart River outflow, Pike's Portage at Great Slave Lake, and Parry Falls), but the Project would only be visible from three of these. Because these locations are situated below the treeline, actual visibility of the towers is anticipated to be less than that described by the viewshed analyses. In addition to the above specific tourist destinations, the transmission line would cross over the Taltson and Snowdrift rivers, which are popular destinations for wilderness canoeists. As a result, the transmission line would be visible to canoeists travelling beneath it on these rivers. Further, the transmission line would cross Pike's Portage. Although it is not visible at either end of the portage, it would be visible at some of the sections between.

The effects assessment includes the Project-specific (or incremental) effects, and the cumulative effects to VCs from all overlapping historic, and current projects and activities. The assessment of cumulative effects would have a greater degree of uncertainty (a fact acknowledged in MVEIRB, 2004) due to limited baseline data or assumed environmental conditions prior to human activity. In the case of estimating effects to wilderness character, cumulative effects may be estimated by effects from aesthetics from several different sources. In other words, if more than one development may be seen from a particular location, there is a cumulative effect.

Table 15.10.5 identifies five tourist destinations within the LSA from which the Project may be visible during operations. Any overlapping effects to these destinations from other developments are considered to be cumulative effects. Three of these destinations (North of Reliance, Trophy Lodge, and the Lockhart River outflow), are within the boundaries of the proposed East Arm National Park. Assuming that the establishment of this Park proceeds, no further development is anticipated within the Park boundaries. Thus, there would be Project-related incremental effects to the tourist destinations of North of Reliance, Trophy Lodge, and the Lockhart River outflow, but cumulative effects are not anticipated. The remaining two tourist destinations (narrows between Lac du Sauvage and Lac de Gras, and the Lac de Gras Hunting Camp) may be subject to cumulative effects. The narrows between Lac du Sauvage and Lac de Gras would be within 6.5 km of the transmission line at the nearest point. Also within 6.5 km, and clearly visible, is the waste rock pile from the Ekati diamond mine, Misery Pit. The Misery Pit is also likely to be visible from the Lac de Gras Hunting Camp, which is approximately 9 km away.

15.10.6 Residual Effects Summary

Of the tourist destinations within the treeline, 10 km of transmission line would be visible from Trophy Lodge at a distance of at least 4.6 km, 15 km of transmission line would be visible from the area north of Reliance from a distance of at least 9.3 km, and towers and 2 km of transmission line would be visible from the Lockhart River outflow at a distance of at least 3.1 km. Above the treeline, 13 km of transmission line would be visible at the Lac de Gras narrows, and 1 km of transmission line would be visible at the Lac de Gras Hunting Camp from a distance

of 6.3 km. Of the proposed East Arm National Park tourist destinations, three of the six tourist destinations selected would be affected. Additionally, the transmission line would be visible to any canoeists travelling under it on the Taltson or Snowdrift rivers. The visual effects of the Project would only occur for the lifetime of the Project, as they would end with removal of the transmission line towers.

15.10.7 Residual Effect Classification

15.10.7.1 METHODS

Effects to tourism potential and wilderness character are described using the following criteria:

- direction
- magnitude
- geographic extent
- duration
- reversibility
- frequency
- likelihood

Table 15.10.6 defines the categories that are used to describe the various levels of effects associated with each criteria. Further definitions of each of the criteria are provided in Chapter 10 - Assessment Methods.

Table 15.10.6 — Criteria Used in the Residual Effects Classification of Assessment Endpoints for Tourism Potential and Wilderness Character

Direction	Magnitude	Geographic Extent	Duration	Reversibility	Frequency	Likelihood
Neutral: no residual effect Adverse: a less favourable change relative to baseline values or conditions Beneficial: an improvement over baseline values or conditions	Negligible: no predicted detectable change from baseline values Low: effect is predicted to be within the range of baseline values Moderate: effect is predicted to be at or slightly exceeds the limits of baseline values High: effect is predicted to be beyond the upper or lower limit of baseline values so that there is likely a change of state from baseline conditions	Local: small-scale direct and indirect effect from the Project (e.g., footprint, physical hazards, and dust deposition) Regional: the predicted maximum spatial extent of combined direct and indirect effects from the Project that exceed local-scale effects (can include cumulative direct and indirect effects from the Project and other developments at the regional scale) Beyond Regional: cumulative local and regional effects from the Project and other developments extend beyond the regional scale	Short-term: effect is reversible at end of one year Medium-term: effect is reversible at the end of the construction phase Long-term: effect is reversible after the assumed 40-year operation period Indefinite: the duration of the effect is indefinite beyond the assumed 40-year operation period	Reversible: effect would not result in a permanent change of state compared to “similar” ¹ environments not influenced by the Project Irreversible: effect is not reversible (i.e., duration of effect is indefinite or permanent)	Isolated: confined to a specific discrete period Periodic: occurs intermittently but repeatedly over the 40-year assessment period Continuous: occurs continually over the 40-year assessment period	Unlikely: effect is likely to occur less than once in 100 years Possible: effect is possible within a year, or at least one chance of occurring in the next 100 years Likely: effect is probable within a year, or at least one chance of occurring in the next 10 years Highly Likely: effect is very probable (100% chance) within a year

¹ “similar” implies an environment of the same type, region, and time period.

15.10.7.2 RESULTS

Table 15.10.7 summarizes the results of the residual effect classification for the assessment endpoints related to tourism potential and wilderness character. Changes to the aesthetics of tourist destinations have an adverse effect on wilderness character. Overall, effects are considered to be similar during the construction and operations phases. Although the transmission line would not be present on the viewshed during construction, effects would nonetheless begin with the construction activity and addition of infrastructure (such as transmission towers) to the landscape. The classification of these effects must consider the total effect to all tourist destinations. Five of the 11 tourist destinations, identified within the vicinity of the Project, may have their viewshed affected by the Project. Of these, two may be subject to cumulative effects (i.e., more than one development may be visible). Considering the pristine nature of some of these areas, and the fact that the transmission line would traverse a proposed national park, the magnitude of effects to visual aesthetics was therefore considered to be moderate. Because of the distance of the Project from reasonably foreseeable projects, and considering that further development would not proceed within the Park, the cumulative effect was also considered to be moderate. Changes to the viewshed were considered to be regional in geographic extent (for both the incremental and cumulative scenarios), as they are contained within approximately 20 km of the Project. These effects would be of medium-term duration (as effects would end with removal of the transmission line), but reversible following closure. The effects would be periodic if effects to seasonal tourists are considered, but the effect of the Project on the landscape was considered to be a continuous effect to wilderness character (as the Project is present throughout the year).

15.10.8 Assessing Significance

The classification of residual effects on Valid pathways for Effects to Tourism Potential and Wilderness Character provides the foundation for determining significance of the Project on assessment endpoints. In the DAR, determining significance considers the entire set of pathways that influence a particular assessment endpoint. Significance is only determined for assessment endpoints, and not individual pathways. Assessment endpoints represent the ultimate properties that should be protected for use by future human generations. Magnitude, geographic extent, and duration (which includes reversibility) were the principal criteria used to predict significance. Other criteria, such as frequency, likelihood, and ecological context were used as modifiers, where applicable, in the determination of significance. As this SON has a single Valid pathway, significance would be based on this pathway alone.

The transmission line would be located within landscapes with limited visual or noise indication of human presence, and would traverse the proposed Park. The operating transmission line causes only negligible noise, and Project design considered a transmission line alignment and barge staging areas that would reduce their effects to visual aesthetics and wilderness character. Key to assessing significance of effects to wilderness character and tourism potential are the following proposed mitigations:

- barge staging areas on Great Slave Lake would be at least 300 m inland, reducing noise from these camps to Great Slave Lake;
- construction activities in the vicinity of the caribou hunting camps would take place in winter, outside of the caribou hunting season;
- the transmission line crossing of the Lockhart River within the proposed Park would be determined through discussion with the community of Łutsel K'e;
- there would be no winter roads or temporary access trails within the proposed Park; and
- adjustments were made to the transmission line alignment between Gahcho Kué and Ekati to make it less visible from MacKay Lake and Lac de Gras.

The residual effects are anticipated to be moderate in magnitude, regional in geographic extent, and medium-term in duration (Table 15.10.8). Ultimately, these effects would be reversed by removing the transmission line towers following Project closure. Although there would be residual effects due to the Project, overall they are not considered to be significant to the preservation of tourism potential and wilderness character within the RSA. Because of the proposed Park and the low levels of development within the RSA, cumulative effects are also anticipated to be not significant (Table 15.10.8).

Table 15.10.7 — Summary of Residual Effects Classification of Valid Pathways for Tourism Potential and Wilderness Character

Valued Component	Pathway	Phase	Direction	MAGNITUDE		GEOGRAPHIC EXTENT		Duration	Frequency	Reversibility	Likelihood
				Incremental	Cumulative	Incremental	Cumulative				
Enjoyment of wilderness	Effects of visual aesthetics to tourist enjoyment of wilderness	Construction Operations	Negative	Moderate	Moderate	Regional	Regional	Medium-Term	Continuous	Reversible	Highly Likely

Table 15.10.8 — Determination of Significance for Tourism Potential and Wilderness Character

Assessment Endpoint	Pathway	Phase	Direction	MAGNITUDE		GEOGRAPHIC EXTENT		Duration	SIGNIFICANCE	
				Incremental	Cumulative	Incremental	Cumulative		Incremental	Cumulative
Preservation of tourism potential and wilderness character	Effects of visual aesthetics to tourist enjoyment of wilderness	Construction Operations	Negative	Moderate	Moderate	Regional	Regional	Medium-Term	Not Significant	Not Significant

15.10.9 Uncertainty

Uncertainty refers to the level of confidence in the effect prediction. The purpose of this section is to discuss how uncertainty has been addressed, and to highlight areas of low certainty.

There is a moderate to high degree of confidence in the predictions of significance of incremental and cumulative effects from the Project on tourism potential and wilderness character. The current level of activity in the boreal region of the Project is low, and mitigation would be implemented to limit effects from the Project (such as considered placement of the infrastructure and timing of construction activities to avoid tourist destinations and seasons). The assessment predictions are based on the assumption that the proposed Park would proceed with boundaries as currently proposed, and that the transmission line would cross the Park in the currently proposed location.

Visitors' perceptions of the effect of hearing aircraft noise or viewing a transmission line on their wilderness experience are likely to be highly variable from one individual to another. It is expected that some individuals are unlikely to notice, while for other individuals it may be a distinct detraction from their experience. For example, the Lac de Gras Hunting Camp has remained a viable business despite the presence of two mining operations within 15 km, clearly visible from Lac de Gras. To accommodate this variability in perception when conducting the effect assessment, it was assumed that hearing or seeing Project activities or facilities would detract from the wilderness experience. It is difficult to assess the effect of changes to visual aesthetic on wilderness value and to the tourism potential on which tourism depends. For example, the Lac de Gras Hunting Camp continues to be a successful business in spite of the presence of the Diavik diamond mine and the Ekati diamond mine (Misery Pit) on the shore of Lac de Gras, and in clear view of some of the hunting destinations.

Uncertainty about the availability and abundance of caribou related to tourism potential and wilderness character is related to two key factors: an incomplete understanding of caribou populations, and uncertainty related to caribou responses specific to the Project.

Project-specific and cumulative effects on caribou abundance and distribution affect the certainty of the prediction of effects of caribou availability for hunting and viewing. Issues related to both natural population variability as well as the influence of the cumulative effects of human activity are addressed in Chapter 12 – Barren-ground Caribou. The second source of uncertainty relates to the use of hypothetical disturbance coefficients and ZOI on caribou related specifically to the Project. There is the possibility that caribou may be affected by the Project in a way that is not anticipated by applying the published ZOI. This in turn may have the effect of changing the availability of caribou for hunting or viewing in a way that is not anticipated by applying the published ZOI. The uncertainty related to prediction of effects on caribou is explained fully in the KLOI: Barren-ground Caribou.

15.10.10 Reasonably Foreseeable Projects

Cumulative effects assessment should include all other human activities that may substantially affect the VC, including past, present and reasonably foreseeable future projects (MVEIRB 2004). Based on the criteria for selecting reasonably foreseeable future projects (Chapter 10), the following proposed projects have been selected as a suite of major developments that may occur in the reasonably foreseeable future.

- the Gahcho Kué Project was considered an existing project in the effects analysis and assessment;
- a small-scale diamond mine in the Lac de Gras region owned by Peregrine Diamonds Ltd., which hauls ore to Ekati for processing;
- the Tyhee NWT Corp Yellowknife Gold Project;
- the Bathurst Inlet Port (BIPR) and Road Project; and
- the East Arm National Park.

With the exception of the proposed East Arm National Park, all of these reasonably foreseeable future projects are greater than 20 km from the viewshed receptors and lodges identified in Section 15.10.5 and Table 15.10.5. The claim block surrounding the Peregrine Diamonds Ltd. WO property extends to the MacKay Lake outflow, so some disturbance to sport fishing and sport caribou hunting from the MacKay Lake Lodge may occur. Currently, there is little activity at the WO camp, as Peregrine Diamonds has concluded that further development of the site is not currently economically justifiable (Peregrine Diamonds Ltd., 2008). The proposed East Arm National Park would likely lead to a halt to development within its boundaries, eliminating the likelihood or degree of future cumulative effects.

15.10.11 Monitoring

During the Project construction phase, environmental monitors would oversee issues such as camp waste disposal, human-wildlife conflicts, compliance with guidelines and regulations (such as DFO 2005, 2007) and to manage any unanticipated Project conflicts with wildlife. To test the effectiveness of the proposed mitigation, unauthorized use of the proposed winter roads from Fort Smith to Twin Gorges and from Twin Gorges to Nonacho Lake would be documented by the environmental monitors. Further, any evidence of wildlife harvesting, ice fishing, recreational snowmobiling, firewood harvesting, camping, or any other such activities, would be recorded.